cc - Craighead
Carter
Keen
R.O.
Experiment Station

March 25, 1942

File

Res. 43B
45 2.

MEMORANDUM FOR MR. J. M. MILLER

Re: Comparison of Growth and Insect Loss on Black's Mountain Experimental Forest. 1933-1940.

This memorandum is prepared in reply to the question raised by Mr. Carter with regard to the net loss occurring on the Black's Mountain Experimental Forest when figured against annual increment.

It is well recognized that unless growth has compensated for the annual losses during the past centuries our present forests would be non-existent. However, it must also be recognized that, at present, much of the western commercial pine timber is being rapidly depleted as a result of continued bark beetle activity. There are many acres in the Modoc, Lassen, and Plumas National Forests which have suffered severely from losses by insects. An almost total depletion of the pine resources has occurred on some of these areas.

In the establishment of the Black's Mountain Forest it was realized that the control of losses would be first in importance, if not the limiting factor, for the successful practice of sustained yield forestry on this experimental area. Insect caused loss has been measured on the entire 10,000 acres at Black's Mountain since 1933. The summary of loss for the period of 1933-1940 shows that 5.9 percent of the original green volume has been killed. The average annual loss has amounted to 139 board feet per acre, ranging from a low of 65 board feet per acre in 1938 to a mean of 203.4 board feet during the high loss level between 1933 and 1936.

In the original 100 percent green cruise of the experimental area in 1933, a tally was made of all trees, including poles above 4" D.B.H. By using this summary of the green stand, the Pine Management Division of the Experiment Station has estimated the annual increment for the virgin areas on the forest at 105 board feet per acre. Differences in volume per acre, percent of total volume in Dunning tree class 1, average volume per tree, poles per acre, and percent of poles in class 1, have resulted in growth estimates between 94 and 110 board feet per acre. A comparison of loss against estimates of growth for the period in which annual loss has been measured is given in table 1.

It will be noted from the table that there has been an average annual net depletion of 34 board feet per acre. The most serious depletion has occurred in the timber on the south exposure of Black's Mountain in Block B. For the area as a whole the average annual loss has exceeded annual growth by 32 percent.

Table 1. Relation of Growth and Insect Loss on Black's Mountain Experimental Forest. (Volume, B.M. per acre. 1933-1940)
Virgin Areas Only

Block	Total 1933-36 (3.1 years) Growth	Loss	Average Annual Growth	Insect Loss 1937	1938	1939	1940	Total 1933-40 Growth	Loss	Average Annual Net Depletion
A	291	264	94	54	35	65	76	667	494	+24
B	341	957	110	94	93	137	180	781	1464	-96
C	329	713	106	52	60	111	100	753	1035	-40
G	326	508	105	67	65	64	121	746	825	-11
F	329	668	106	89	72	117	122	753	1067	-44
All	326	631	105	70	65	101	117	746	985	-34

Another factor which gives impetus to the loss condition is that of value of increment. A majority of the trees which have been killed occur in the diameters ranging between 24 and 36 inches, breast height. The mean diameter of the infested tree is 31 inches. From the Log and Tree Values of the 1939 Black's Mountain Mill Study, Hereford Garland of the Experiment Station Staff has listed the value per M, net schedule B, of trees between 30-33 inches DBH, at $19.46. The discrepancy then between annual loss and increment would be further accentuated when considered from the standpoint of value of increment and value of loss. A majority of annual growth is considered to occur in the trees of younger age groups with a present value less than the clear lower boles of the older and larger trees which make up a large majority of the seasonal loss.

A reduction in loss by sanitation-salvage control has ranged between 77 and 91 percent for the period of 1937-41. This light cut has averaged about 17 percent of the total green volume. Growth estimates in the reserve stands on these areas selectively cut average 92 board feet per acre. The average annual loss subsequent to the sanitation-salvage treatment has been but 14 board feet per acre. Therefore, on these treated compartments the net growth has ranged between 75 and 81 board feet per acre. Between treated and untreated compartments, then, the cutting has resulted in a net gain of 112 board feet per acre. A tabulation of the relation of growth and insect loss on areas treated by sanitation-salvage logging is given in table 2.

Table 2. Relation of Growth and Insect Loss on Areas Treated by Sanitation-Salvage Logging. Black's Mountain Exp. Forest.

Block	Average Annual Growth	Insect Loss 1938	1939	1940	Annual Net Growth
B	94		21	16	+75
G	89	15	8	1	+81

Respectfully Submitted,

J. W. Bongberg
Assistant Entomologist

Berkeley, California
March 25, 1942